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THE IMPACT OF TECHNOLOGICAL DEVELOPMENTS UPON THE PROSPECTS  
FOR AN ADEQUATE WESTERN EUROPEAN DEFENSE

GENERAL CONCLUSIONS

1. The total scientific and technological potential of the NATO powers will continue to surpass that of the Soviet sphere. However, recent NATO weapons programs have been disappointing in terms of new weapons to bolster the defense of Western Europe. On the other hand, NATO capabilities can be significantly increased within one to three years by vigorous prosecution of the development and procurement of improved weapons in such categories as land mines, infantry anti-tank weapons, and ground attack aircraft.
2. If an adequate defense of Western Europe is to be developed, scientific and technological capabilities must be concentrated on the expeditious development of unique or unconventional weapons and methods that will counteract:
  - a. The current vast Soviet quantitative superiority in military manpower and materiel (other than atomic weapons and certain electronics equipment).
  - b. Soviet atomic warfare capabilities which even now can cause significant damage.
  - c. Significant Soviet progress in BW, CW, guided missiles, underwater warfare, infrared night fighting equipment, armored combat vehicles, and electromagnetic warfare.
  - d. The guidance provided Soviet countermeasure development by the continuous release of data on new U.S. weapons.

ATOMIC WARFARE

1. While the U. S. has a much larger stockpile of atomic bombs, the USSR has enough to cause significant damage. During the next few years, the ratio between the U. S. and Soviet stockpiles will decrease as the Soviets accelerate production even though the U. S. will increase its large numerical lead in actual numbers of bombs. The Soviets probably will attempt to use their atomic capabilities psychologically to detach weak-hearted members from the NATO group, and later to obtain a prohibition of atomic warfare.

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2. If thermo-nuclear weapons are feasible, it is possible that either or both sides may develop a practical weapon by 1954. Unless thermo-nuclear weapons require less fissionable material than is now estimated, it is doubtful if the Soviets will fabricate them prior to the attainment of a large stockpile of fission weapons.

3. The damage inflicted upon the Soviet industrial economy by a U. S. strategic air offensive would not immediately reduce the present Soviet capability for invading Western Europe since Soviet forces can obtain logistic support for at least three months from forward area stockpiles. However, devastating strategic atomic bombardment could cause a revision of Soviet war plans.

4. Although appreciable numbers of atomic bombs can be made available for tactical use against worthwhile, forward area targets, the over-target weapons required to assure seriously delaying initial Soviet campaigns are beyond the capabilities of the NATO powers, at least through 1954. However, targets of opportunity will emerge against which tactical atomic attack could temporarily delay Soviet advances at many points.

#### BIOLOGICAL WARFARE

1. Sabotage attacks with BW agents may be employed by the Soviets at any time, even well in advance of D-Day. By 1952 at the latest, the Soviets probably could be capable of large scale military attack with BW to supplement AW and CW attacks against population centers. Except for sabotage attack against personnel in key installations, there is some doubt that the Soviets would employ BW in Continental Europe as part of a plan to overrun and occupy that area. However, because of its isolated geographical position, the United Kingdom may be a particularly inviting testing ground for BW.

2. Current NATO capabilities for employing BW are limited to sabotage attack. Disseminating devices for military attack probably will not be available in quantity before 1952. Large scale employment of BW against the USSR probably would not provide immediate hindrance to a Soviet attack. However, sabotage employment against key Soviet military headquarters in Eastern Germany and other peripheral areas might be effective.

#### CHEMICAL WARFARE

1. The Soviets probably have sufficient nerve gas for a mass lethal attack on a number of cities, and by 1952 will have quantities for sustained extensive employment. The NATO powers possess comparatively minute stocks of nerve gases, but by mid-1952 may be able to deter Soviet employment by having a capability to retaliate in kind.

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2. The defense of Western Europe requires early provision of adequate nerve gas detection and protection equipment not currently available. Efforts must be made to at least keep abreast of Soviet development of even more toxic agents.

#### AIRCRAFT

1. The Soviets will probably not have a heavy bomber with the range capabilities of the U. S. B-36 until 1953. The lack of this aircraft will not restrict the Soviets in an attack on Western Europe since the TU-4 is adequate for this purpose, and also can reach vital U. S. targets with refueling and/or one-way missions.

2. Soviet and NATO jet aircraft that could be employed in the ground attack role are comparable in performance. However, the Soviets currently have the definite advantage of possessing a conventional special purpose ground attack aircraft. Therefore, pending the availability to the NATO powers of a special purpose ground attack aircraft, the Soviet ground forces are likely to enjoy more complete tactical air support.

3. The recent introduction of Soviet jet light bombers (Type 27) accelerates the need for adequate defense against low-flying, high-speed aircraft.

4. Because of the large number of aircraft available to the USSR, the possibility of saturation of the British air defense system by Soviet air power is considered a most poignant danger to the UK.

#### GUIDED MISSILES

1. The Soviets may now be capable of employing versions of German V-1 and V-2 missiles. These missiles could contain sub-optimum atomic warheads, although it is doubtful that such warheads are being stockpiled. While the V-1 and the V-2 are not decisive weapons, their employment would increase the burden on Western European (and UK) air defense, and might possibly require the allocation of both air and ground forces to neutralize the launching sites.

2. The NATO powers currently are developing an improved version of the German Taifun, a supersonic, barrage type, unguided rocket which probably will not be available before 1954. Supersonic surface-to-air guided missiles with automatic electronic guidance and control may be available to the NATO powers in late 1953. Availability of those weapons will substantially increase NATO overall air defense capabilities, but per se, offer no immediate solution to the problem of defense against V-2s or low-flying, high-speed aircraft.

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#### GROUND WEAPONS AND EQUIPMENT

During 1951, significant Soviet technological advances may well be reflected in operational quantities of improved medium tanks, land mines and detection countermeasures, and infrared viewing and sighting equipment. The development by the NATO powers of improved land mines and infrared night fighting equipment could materially increase their defensive capabilities. Also, the proper tactical adaptation of the promising developments in vastly improved, infantry anti-tank weapons can do much to negate the qualitative and quantitative advantages in armored combat vehicles now held by the Soviets.

#### NAVAL WEAPONS

In both the Western and Soviet spheres, offensive underwater warfare is likely to continue to lead the development of countermeasures for some time. Therefore, unfortunately, Soviet underwater weapons probably will be ahead of NATO countermeasures, and there is strong possibility that the Soviets could seriously restrict NATO shipping to Western European ports. However, accelerated development and procurement of high-speed surface transports, and presently planned mines, as well as the development of numerous, well-dispersed small port facilities and provision for landing supplies over beaches, would materially assist the NATO powers in overcoming this danger within two or three years.

#### ELECTROMAGNETIC WARFARE

It is estimated that with present facilities the Soviets can, at any time, effect complete disruption of intercontinental point-to-point and long distance mobile radio communications of all types, including the critical North Atlantic systems. The Soviets are rapidly expanding their facilities and the required experience. The potential of the NATO powers to meet this threat is inadequately organized and many of the required technical systems and facilities for defense and counteroffense do not exist.

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